

The word *playing* has many facets. It can describe an extremely pleasant experience, such as, “I’m playing golf,” or a terrible one, such as, “She’s just playing with me.” Playing can refer to games, music, theatre, relationships, and even mechanics, as in “too much play [looseness] between the cogs.” Whatever the context, we tend to feel that this word should somehow be distant from schools and formal education—the older the students, the more distant play is from their classes, an activity reserved for sports and games played after school hours and on weekends.

At its core, playing is our word for describing a child’s activity of exploring the world. As soon as newborns achieve control of their sight and of their hands, they start staring at all new objects, touching and grasping everything they find—often putting these things into their mouths as acts of intense learning and appropriation. For babies and young children, it seems natural to associate playing with learning and learning with the pleasure of making new discoveries.

## Principles of Playing Games for Learning

Games are specific forms of playing that often develop out of human beings’ natural tendency to play. Games are a set of rigid structures—namely, rules and rules embodied by toys—that define a limited action space. Playing a game means willingly entering a rigid structure and animating it with free movement (Salen & Zimmermann, 2003, p. 304). An example could be a basketball player’s ability to perform graceful, effective movements on the court, such as scoring a basket after perfect dribbling. Just as the basketball player derives a refined form of pleasure from his or her achievement, players of instructional games in K–12 classrooms can gain new insights into subject matter while enjoying the excitement of the game.

In this chapter, we provide historical insights into the use of games for teaching and learning. These insights prepare the way for a discussion of the relative benefits and drawbacks of using games in education. These benefits and limitations, in turn, lead to a set of applied principles and prescriptions: structured advice to teachers who would like to use games in their classrooms.

## Insights into the History of Games in Education

In this section, we explore the past use of simulations and games in education. This would be a good subject for a huge book, but we will limit our scope in two respects. We will consider only the history of Western culture, and we will do it through the eyes and words of two educators and authors who identified a common theme across the centuries: Quintilian, who lived in Rome in the first century AD, taught rhetoric, wrote a multivolume work on oratory, and worked as a pleader (similar to a defense attorney), and Maria Montessori (1870–1952), an innovative Italian educator whose strategies for teaching young children, *The Montessori Method* (1912), continue to be influential today.



## Quintilian: Games and Education in Ancient Rome

The Roman Empire embraced almost all the known world of ancient times, from Africa to England and from Spain to the near East. Rome was a busy and lively city, overflowing with people from all races and traditions, and public and private life was filled with games. We are aware of a number of dice, marbles, and board games from Roman times that blended different traditions and were built with precious materials. An example is Tabula, a military version of modern backgammon, whose roots can be traced back to Egypt. Some exemplars of this game were carved in marble or precious wood; Emperor Claudius purportedly had one built into his imperial carriage. At a public and institutional level, the year was structured around religious and public feasts, when games and shows—such as sports competitions, gladiator fights, and/or theater productions and musical performances—were high points of annual celebrations.

The Latin words for “game” and “playing” were *ludus* and *ludere*, so that gladiators fought in *ludi gladiatorii*, and theater shows were acted in *ludi scaenici*. *Ludus* indicated any activity that was not related to working and earning money for living and was, therefore, part of the *otium* (leisure) that only free and rich people could enjoy (Botturi & Loh, 2008). Leisure activities included sports, music, arts, fighting, public speaking, reading and writing literature, and learning mathematics and science. Indeed, these activities included all that the Romans understood to be part of the education of the sons of their best families. In short, the early Romans’ leisure activities included what we now call “school,” even if it took a rather different form.

The word *ludus* also indicated the place where people trained for sports or other games, such as the outside-of-city location of a *lanista*, the owner and trainer of gladiators. When public schools were founded, they, too, used the name *ludus*, so that the very word used for “game” was also used for “school.” From our modern perspective of regarding fun as being opposed to work and viewing studying as work, using the same word for game and school can be counterintuitive. Yet, when we begin to see that teaching and learning, the education of children, and games have a great deal in common, we are reminded of the roots of Western culture. Games actually have a large potential as teaching and learning tools that we can learn to exploit in the 21st century.

So, ?  
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What was the role of games in Roman formal education? Parents carried out the education of their children until the later age of the Empire, when public schools and eventually fee-based schools were opened. While we do not have many documents about the teaching methods of ancient Rome, we can rely on the words of Quintilian (1856/2006), a Hispanic Roman citizen. He opened the first public rhetoric school, funded by the state treasury around AD 70. In the *Institutio Oratoria* (*Institutes of Oratory*, comprising 12 books or volumes), Quintilian recorded the school’s method for the fundamental education of an orator. In Rome at that time, before a man could participate fully in the civil life of the Empire, he had to be an excellent orator. Although specific in terms of subject matter, Quintilian’s work is regarded as the highest summary of Roman education.

In the first book of *Institutes of Oratory*, Quintilian emphasizes the connection between amusement and learning, saying that children need to enjoy (not dislike) instruction so that they will be motivated to continue to learn as they grow older:



For it will be necessary, above all things, to take care lest the child should conceive a dislike to the application which he cannot yet love, and continue to dread the bitterness which he has once tasted, even beyond the years of infancy. Let his instruction be an amusement to him. (1856/2006, book 1, chapter 1, paragraph 20)

Amusement is paramount, “because application to learning depends on the will, which cannot be forced” (Quintilian, 1856/2006, book 1, chapter 3, paragraph 8), just like in games, where no one can be forced to play (Botturi & Loh, 2008). How can teaching and learning become amusing and enjoyable?

... let him be questioned and praised; let him never feel pleased that he does not know a thing; and sometimes, if he is unwilling to learn, let another be taught before him, of whom he may be envious. Let him strive for victory now and then, and generally suppose that he gains it; and let his powers be called forth by rewards such as that age prizes. (Quintilian, 1856/2006, book 1, chapter 1, paragraph 20)

If we were asked to rewrite this last quotation with modern terminology, we would use words such as **feedback** (be praised/never feel pleased); **competition** (let another be taught before him/ strive for victory); and **rewards**. Interestingly, these words belong to the domain of games. Games, and video games among them, offer tools, design concepts, and new yet traditional perspectives for education.

Another reason for integrating games into teaching and learning is that boys and girls naturally like to play. Quintilian offers an even more convincing argument for making games part of instruction: when we observe their gameplay, we see students’ natural vivacity:

Nor will play in boys displease me; it is also a sign of vivacity, and I cannot expect that he who is always dull and spiritless will be of an eager disposition in his studies, when he is indifferent even to that excitement which is natural to his age. (1856/2006, book 1, chapter 3, paragraph 10)

Yet Quintilian moves a step further, noting that **when students enter a game, their individual personalities become more evident**: “In their plays, also, their moral dispositions show themselves more plainly ...” (1856/2006, book 1, chapter 3, paragraph 12). **A game is indeed a safe space, delimited and at the same time protected by its rules, where the players’ personalities can more freely emerge**. Indeed, this is an important point for teachers to remember as they try to develop empathy with their students.

But what exactly are the games to which Quintilian refers? The Roman public speaker was experienced enough to understand that not all games have positive impacts on learning:

There must, however, be bounds set to [play], lest the refusal of it beget an aversion to study, or too much indulgence in it a habit of idleness. There are some kinds of amusement, too, not unserviceable for sharpening the wits of boys, as when they contend with each other by proposing all sorts of questions in turn. (1856/2006, book 1, chapter 3, paragraph 10)





While playing remains a natural mode of learning, structured play, i.e., through games, is a way to control this mode and to make it purposeful. We will discuss the notion of play more in the next section, as we discuss the writings of Montessori. The importance of play structured by rules is also the reason why the next section of this chapter and parts of other chapters in this book provide basic notions of game design. The definitions of goals, rules, feedback structures, and other game elements are what can turn students' natural attitude toward playing into a constructive force for learning, even in formal settings. Teachers may find that their goals are to leverage games "not unserviceable for sharpening the wits" of students and to propose new ones. Additionally, as the authors of Chapter 14 in this book advocate, educators will be amazed to observe that when students design their own educational games, they learn content at deep, analytical levels. ✓

## Maria Montessori: School and Games in the Early 1900s

Two thousand years ago, experienced teachers such as Quintilian recognized the value of playing and games in education. The notion of play to enhance or otherwise facilitate learning has moved on through the history of education and educational theory until today, when the explosive growth of the video game industry and the diffusion of digital technologies have brought renewed attention to games. Before we discuss current educational practices, let's examine some insights from Maria Montessori (1912), an Italian educator who proposed her own pedagogical method for the early education of children. This method, presented in her book *The Montessori Method*, was implemented in the first Children's House in Rome. She moved to Spain and later lived in Sri Lanka and India and established Children's Houses in each country. As more educators heard about the effectiveness of this new method, Montessori schools were established throughout Europe, North America, and eventually worldwide. Many preschools and elementary schools around the world today base their pedagogy on Montessori's methodology.

The main idea supporting the Montessori method is that children and human beings in general are natural learners, curious and with a thirst for knowledge. The main goal of formal education is not to spoil intrinsic motivation but to nurture it, according to each child's character. Montessori's method emphasizes self-paced and self-initiated learning, promoting hands-on and sensory education that fosters experimentation and hypothesis testing, in which the naturally "absorbent mind" of children can find new knowledge. Value is also placed on the community of learners as a stimulus to personal development.

For our purposes, Montessori's idea of discipline, which does not mean sitting still and listening but being active in an ordered way, is insightful. In Montessori's words:

The pedagogical method of observation has for its base the liberty of the child; and liberty is activity. ... We call an individual disciplined when he is master of himself, and can, therefore, regulate his own conduct when it shall be necessary to follow some rule of life. Such a concept of active discipline is not easy to comprehend or to apply. (1912, p. 86)

Now, liberty in children is expressed through playing. Of course, Montessori was aware that some forms of playing are destructive and must be avoided. But she maintains that educating means





stimulating the development of the good nature of children, without constraining their natural drive to learn by imposing rigid forms, helping them grow to their full potential. By allowing free movement within a structured environment—which actually echoes the very idea of gameplay as presented at the opening of this chapter—the teacher can properly observe his or her pupils, because “from the child itself he will learn how to perfect himself as an educator” (p. 13).

We must, therefore, check in the child whatever offends or annoys others, or whatever tends toward rough or ill-bred acts. But all the rest—every manifestation having a useful scope—whatever it be, and under whatever form it expresses itself, must not only be permitted, but must be observed by the teacher. (Montessori, 1912, p. 87)

The very backbone of the Montessori method shares so much with the ways that playing and designing educational games can enhance learning. Actually, an analysis of Montessori’s text reveals that the words “game/games” appear as often as “example/examples” (93 and 95 times, respectively), and more often than “experiment/experiments” (only 28 times).

Montessori cautions that teachers must be careful to select materials that convey useful information, not games or stories with frivolous content. And teachers must take care not to obscure the distinct roles of teacher and students by acting like children themselves; instead, they need to appeal to children’s need to understand worthwhile content that will help them function well as adults.

(...) those who teach little children too often have the idea that they are educating babies and seek to place themselves on the child’s level by approaching him with games, and often with foolish stories. Instead of all this, we must know how to call to the man which lies dormant within the soul of the child. (1912, p. 37)

So what is the point in using games, or even thinking of education as something that has to do with playing? How does this work in practice? We mentioned that the observation of children during free play is the first way teachers can help their students learn. At the same time, directed and purposeful play through educational games with rules is one of the primary tools of the Montessori Children’s Houses. Providing a direction that makes playing ordered toward a definite end is what distinguishes natural play from playing educational games, making the teacher’s guiding role paramount:

We speak, it is true, of games in education, but it must be made clear that we understand by this term a free activity, ordered to a definite end; not disorderly noise, which distracts the attention. (Montessori, 1912, p. 181)

Montessori promotes the idea of nurturing children’s inner lives with freedom to follow activities that provide motivation in and of themselves. While teachers and game designers often try to find a prize, a reward, or a punishment that will motivate learners and/or players, Montessori claims that true motivation arises from within, as individuals are given the freedom to pursue activities from which they gain a feeling of power or mastery:





Man, disciplined through liberty, begins to desire the true and only prize which will never belittle or disappoint him—the birth of human power and liberty within that inner life of his from which his activities must spring. (1912, p. 101)

There is a truth of game design: performing well in a good game is enough to make it worth playing. As we learn to be better players, there is no need for external prizes or motivators. For game designers, this means that players will play only good games. Teachers, in turn, should understand that students will engage only with content and activities that they perceive to be relevant and through which they understand they will learn. Once that happens and they feel engaged, this will be enough to sustain intense, rewarding work.

We hope that these brief insights into the Montessori method shed more light on the connections among games, learning, and education. Indeed, a major game developer, Will Wright, father of SimCity and The Sims and a former Montessori school student, testifies to the power of the Montessori method:

[The] Montessori [method] taught me the joy of discovery. ... It showed you can become interested in pretty complex theories, like Pythagorean theory, say, by playing with blocks. It's all about learning on your terms, rather than a teacher explaining stuff to you. SimCity comes right out of Montessori—if you give people this model for building cities, they will abstract from it principles of urban design. (Will Wright, quoted in Seabrook, 2006)

Wright gave a video presentation in 2007 in which he credits the Montessori school he attended in Atlanta up to sixth grade for engendering his fascination with learning ([www.ted.com/talks/will\\_wright\\_makes\\_toys\\_that\\_make\\_worlds.html](http://www.ted.com/talks/will_wright_makes_toys_that_make_worlds.html)). Before he demonstrates aspects of the game, Spore, which he was developing at that time, he talks about learning by playing with toys designed by Montessori:

And she would design these toys, where kids in playing with the toys would actually come to understand these deep principles of life and nature through play. And since they discovered those things, it really stuck with them so much more, and also they would experience their own failures; there was a failure-based aspect to learning there. It was very important. (Wright, 2007)

## Games and Video Games, Yesterday and Today

Through the words of Quintilian and Montessori, our speedy journey across the centuries offered a number of convincing reasons to integrate games and game-based activities into formal education. Indeed, these types of activities seem to be a part of the Western educational tradition in their own right.

Why is it, then, that many educators feel games are so distant from school? Peters (2008) argues that distance education is the most industrialized form of education and that “undoubtedly, distance education is ... a result of the historical development of teaching and learning” (p. 140). The last two centuries have achieved the great goal of opening education to all citizens and



children, a movement that is ongoing under the heading of “lifelong learning.” While lifelong learning is an extremely valuable achievement, public schools have had to cope with large numbers of students, bringing about the standardization of education, or, as Peters (2008) puts it, “mass production.” Technology, and digital technology in particular, has played a special role in this transformation of education. On one hand, technology supports and reinforces the mass production and wide availability of education, specifically in the forms of distance and online education (Peters, 2008). On the other hand, recent advances in technology have pulled educators’ attention back to more human, individual concerns. Digital art, social software, Web 2.0, and instructional video games are so integrated into educational, training, and assessment practices in the business world and in nearly every field, including education, that technology itself is no longer in the foreground. What generates high value is how individual teachers and students (as well as industrial and personnel trainers, bank managers, and many others) choose to use these technologies. The emergence of pervasive technologies coincides with a movement advocating the rediscovery of integrated, meaningful learning in schools, fueled by a recent emphasis on constructivism, as opposed to traditional, teacher-centered instruction.

Younger teachers have grown up in this different, more advanced technological environment; thus, they belong to the first generation of “digital natives” (Prensky, 2001). Moreover, today’s children are fully digital natives because they are growing up with technologies that they do not even perceive as being unusual; personal computers, cell phones, iPods, and more are normal parts of their lives. Herein lies one more important reason for and benefit of using games in education: many students are already familiar with them, so why not use video games as our allies and as catalysts for learning?

## Components of Interactive Entertainment

The first step for integrating a new technology into teaching is to become familiar with the technology itself, not only as a user but also as a reflective user. Teachers need to play games themselves to understand how to integrate them into their curricula and classroom practices most effectively and to use them as additional tools to encourage students’ creativity. Playing games is not enough—or all gamers would be great teachers! Teachers need a reflective experience (i.e., to understand the technology while they use it) to perceive the inner workings of the game, understand how it was constructed, and grasp the logic behind the interface.

To this purpose, we offer a short primer on the basic elements of interactive entertainment. Having the right vocabulary enhances observation, as it allows us to focus on specific elements. The challenge is blending terminology from instructional design and game design in a sensible and useful way.

### Story, Game, Play

Due to the variety of games and playing experiences, it is difficult to find an agreed-upon, crystal-clear definition of game or entertainment. However, we can identify three major components that occur in all gameplay: play, game, and story (Hirumi & Stapleton, 2008). We know that playing